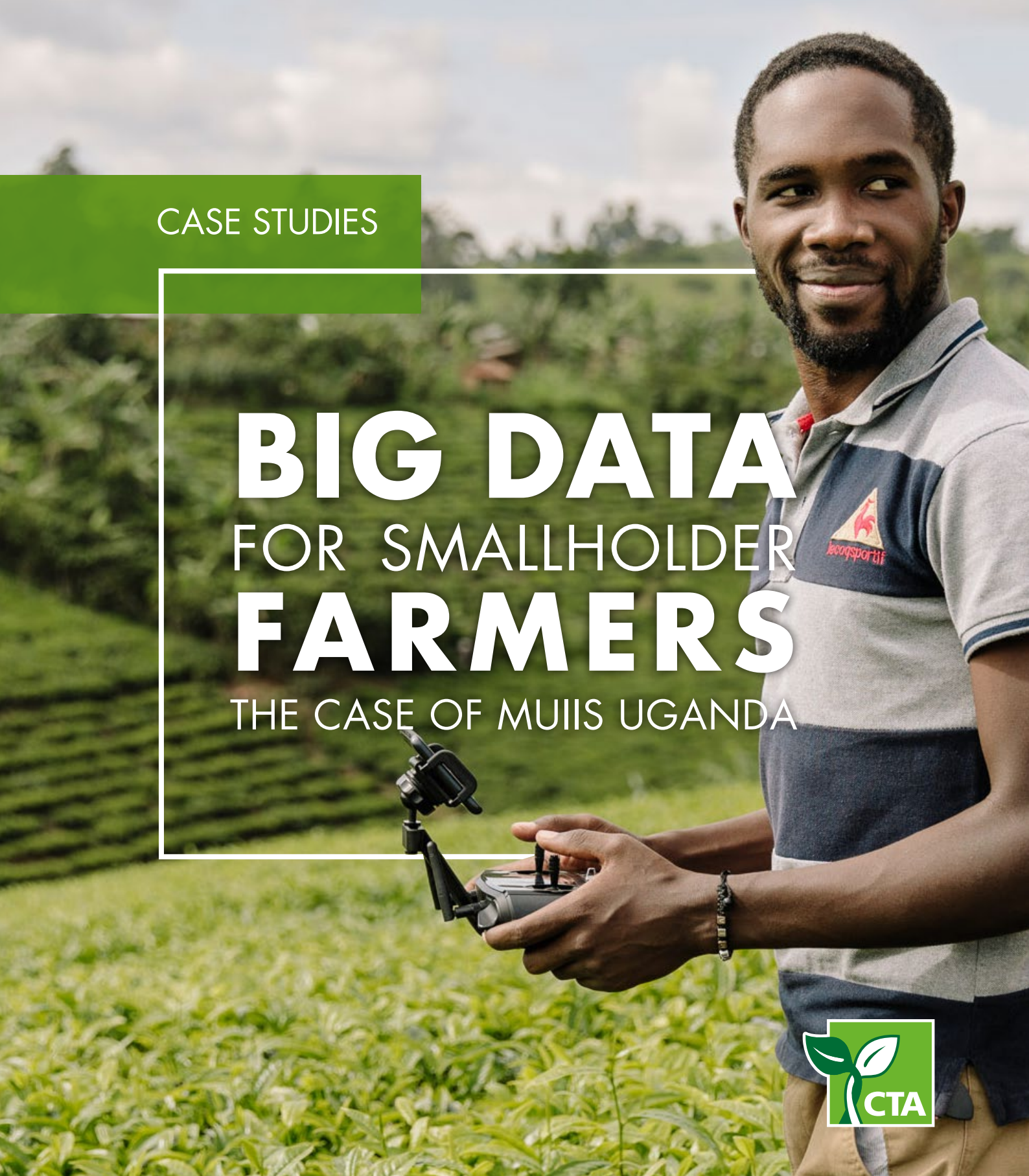

CASE STUDIES

BIG DATA FOR SMALLHOLDER FARMERS

THE CASE OF MUIIS UGANDA

CTA

> “As a pioneer in digitalisation in agriculture, CTA was well positioned to play a leading role in this initiative to link farmers to satellite-based services. Unlike some previous initiatives, this one has had an intensely practical component, involving nearly 200 agents who have been trained by the scheme to pass on their knowledge to farmers and help them to access the ICT-enabled solutions. Central to the initiative are of course the small-scale farmers themselves, many of whom are starting to see the concrete benefits of investing in ICTs to receive precise and targeted information that can lead to better harvests, greater climate resilience and stronger market linkages.”
>
> Michael Hailu,
> CTA Director

This publication reflects the achievements of MUIIS during the first two years of its implementation.

This work has been made possible with the financial assistance of the European Union. However, the contents remain the sole responsibility of its author(s) and can under no circumstances be regarded as reflecting the position of CTA, its co-publisher or the European Union, nor of any country or member State. The user should make his/her own evaluation as to the appropriateness of any statement, argument, experimental technique or method described in the work.

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INTRODUCTION

BRIDGING THE INFORMATION GAP FOR UGANDAN FARMERS

There is massive scope for linking farmers to valuable knowledge and agricultural services through Information and Communication Technologies (ICTs) as a pathway to driving improved productivity and market access, creating opportunities for higher incomes and better food security as a result. In Uganda, as in many sub-Saharan countries, lack of timely and accurate access to information about weather, financial services, crop management, markets and climate coping mechanisms is a serious obstacle for smallholder farmers, preventing them from achieving higher yields and selling their produce for better prices.

To address these challenges, an innovative initiative is showcasing how ICTs can be used to capture satellite-based information on a wide range of agricultural indicators, packaging it into tailor-made messages for farmers in local languages. Led and implemented by the Technical Centre for Agricultural and Rural Cooperation (CTA), which has extensive experience in shaping ICT solutions for smallholder farmers, with seed funding from the Dutch Ministry of Foreign Affairs (MFA) through the Geodata for Agriculture and Water (G4AW) Facility of the Netherlands Space Office (NSO), the Market-led, User-owned ICT4Ag-enabled Information Service (MUIIS) is a satellite data-enabled extension and advisory service that uses ICTs to address the current agricultural information gap in Uganda.

The initiative has been designed to deliver a bundled service offering accurate weather alerts, agronomic tips and index-based drought insurance to help farmers make informed decisions. An unusual feature is the strong business focus, with a number of private sector partners on board and

a design that sets out to create commercial opportunities for a range of players in the selected value chains, currently maize, soybeans, beans and sesame. The ultimate goal is to make the MUIIS system self-supporting, driven by the farmer organisations.

Critical to the success of such an ambitious initiative is the quality of the technical input, with authentic and relevant data that is subsequently transformed into advice for delivery to farmers via mobile phone. For this reason, MUIIS draws substantially on the extensive expertise of six main partners, each of whom brings a particular skillset, as well as a range of other private, public and farmer-based organisations, involved in various activities from helping to build the ICT infrastructure to mobilising farmers.

Already MUIIS has attracted broad interest from the media and beyond. In 2017, the initiative was singled out as inclusive by the New Vision for Development of the World Economic Forum (WEF). And although MUIIS initiative has highlighted the difficulty of convincing smallholder farmers to pay for what many see as intangible benefits, plans are in hand to fine-tune the business model.

This report documents the achievements of MUIIS during the first two years, outlines strategies for full roll-out and identifies opportunities for business partners to engage. As the programme develops, and farmers begin to see the cause and effect relationship between the provision of satellite-based agricultural information and better harvest and market prospects, the initiative is expected to gather increased momentum, with a side effect being the creation of new jobs and income earning opportunities along the value chains.

CHAPTER 1

BUILDING A VIABLE MULTI-PARTNERSHIP MODEL FOR ICT4AG

Increasingly, public-private partnerships are being seen as a prerequisite for successful delivery of ICT for agriculture (ICT4Ag) services to farmers. The mix of partners chosen for the MUIIS initiative reflects this trend, with all six members identified through a competitive process for their expertise and experience in the key areas of data, knowledge and information.

In Uganda, which in common with many African countries relies on agriculture for its economy, farmers often lack sufficient information to make informed choices related to farm management. This deficit is being exacerbated by a rapidly shifting environment caused by climate change, creating uncertainty about when and what to plant and how to husband precious resources.

With substantial experience of working in the ICT4Ag sector, CTA was convinced of the potential for using satellite-based data to improve the production and revenues of small-scale producers and other value chain actors. The premise was that by sourcing reliable satellite data and packaging it in actionable formats to be delivered by mobile phone, farmers could have access to accurate weather-based and agronomic information that would help them to make timely decisions on when and what to plant, which pests and diseases are prevalent, how to control them, and when to harvest and sell at remunerative prices. Adding an index-based insurance component to a bundled service would offer protection against increasingly erratic weather patterns, and specifically drought.

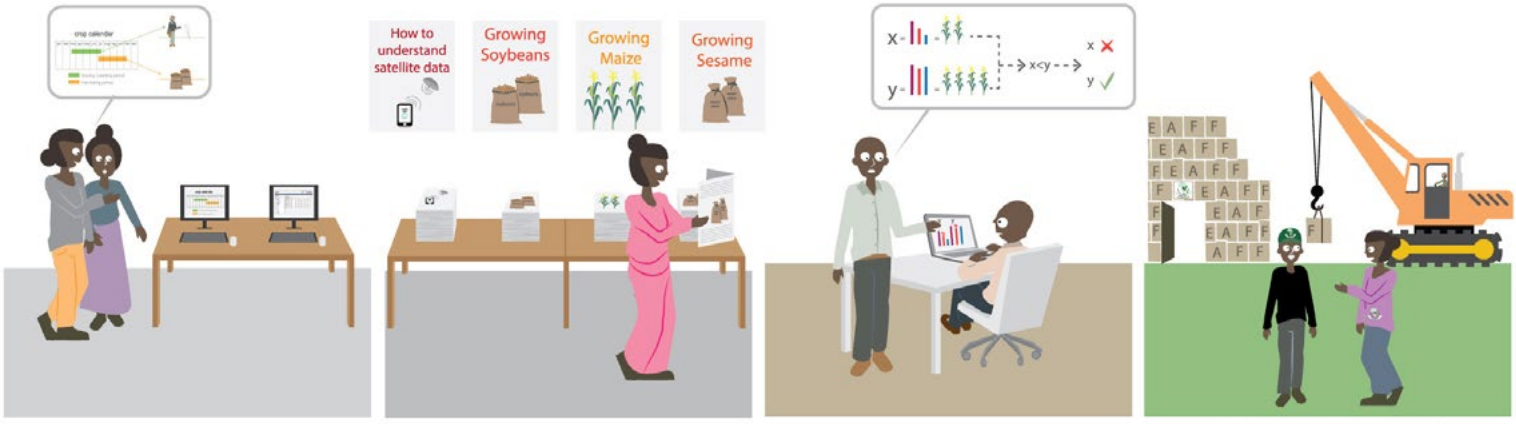
Also taken into account was CTA's experience in a successful pilot initiative in Sudan which sent a weekly SMS to advise farmers when to irrigate their crops, based on satellite monitoring of the plants' water needs at a given time. That scheme, which resulted in increases in yields of up to 250%, was implemented by the eLEAF Competence Center (eLEAF), which would go on to become one of the partners in the MUIIS initiative.

Building a consortium

From the outset, CTA was clear that the success of the initiative, from conceptualisation to implementation, would depend on a mix of

Multi-Stakeholder Approach

Multi-tier Capacity Development



actors, and a multi-stakeholder approach was one of the seven key design principles of MUIIS. With its extensive experiences in African, Caribbean and Pacific (ACP) countries, and its pioneering role in the area of ICT4Ag globally, CTA has built up a rich network of ICT innovators, development partners and other private sector entities. Many of these partners have worked with CTA at some of the international conferences it has hosted, as well as at Web 2 and Social Media, Plug & Play, AgriHack, Pitch AgriHack and social media events, on the Apps4Ag Database and through online Communities of Practice. Based on this strong foundation, the MUIIS consortium was set in place, underpinned by a rigorous vetting process to ensure synergies and complementarity.

Creating a partnership that could bridge the information chain from satellite-based data to knowledge for smallholder farmers was crucial. It would need to cover a wide range of players – technology companies, mobile services providers, government, extension services, traders, agro input companies, NGOs and farmers' organisations – and ensure synergy and a strong local presence. By working with a consortium of partners identified through a competitive process, CTA laid the foundations for a high quality initiative – a factor that was highlighted by the World Economic Forum, which commented: "The technical quality appears to be very high because the consortium of partners brings in the expertise of a wide variety."

Partnership composition

After conducting extensive research, including investigation of an Indian case study where an (ICT4Ag) service provided by farmer cooperatives led to a 40% increase in productivity, CTA embarked on engaging with possible partners and attracting funding. Key partners in the MUIIS initiative are the Alliance for a Green Revolution in Africa (AGRA), based in Nairobi Kenya, aWhere Inc., based in USA, EARS Earth Environment Monitoring (EARS-E2M), based in the Netherlands, the eLEAF BV (eLEAF), also based in the Netherlands, and Mercy Corps, based in Uganda. Also closely involved are the Uganda National Farmers Federation (UNFFE), the Uganda Cooperative Alliance (UCA), originally through their regional body, the East

The MUIIS partners offer a valuable range of skills and experience, which complement each other to provide an effective overall fit.

African Farmers Federation (EAFF), who exited the consortium within the first two years, Ugandan firm Ensibuuko Technologies, which is handling the delivery platform to farmers, the National Agricultural Research Organisation (NARO), supporting agronomic data from the field, and the Agricultural Insurance Consortium (AIC), tasked with the promotion of the insurance product at local level.

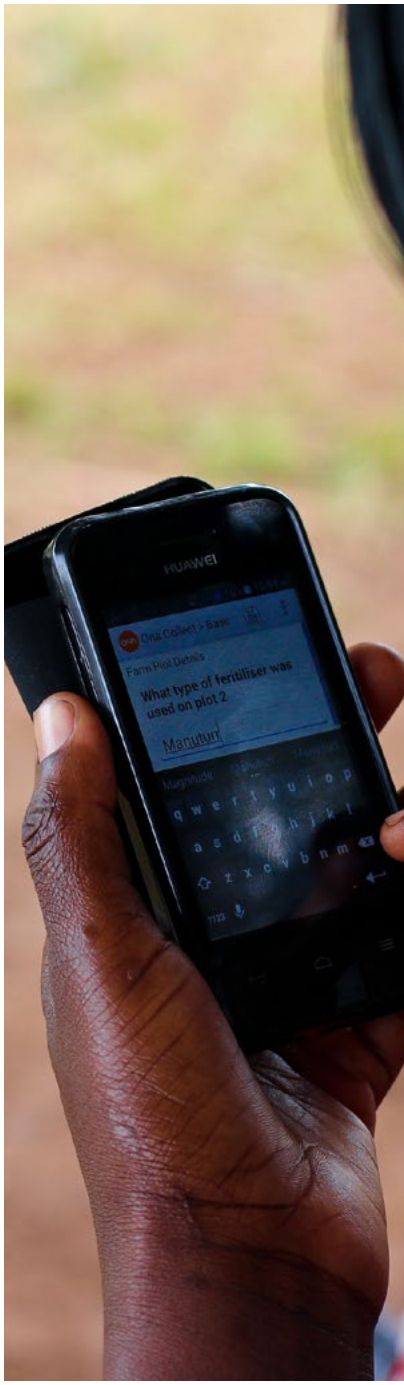
A meticulous procedure was adopted to promote long-term and effective involvement of partners. The first step was to build the consortium's management and business structure. This included setting up a steering committee, holding inception and stakeholder engagement workshops and developing partnership cooperation agreements, with clear expectations that were jointly developed based on the complementarity of each member of the consortium. With the involvement of both private and public sector partners, it was critical to ensure that each one drew some benefit from the relationship – either in the form of future business growth, positive impacts for smallholders, or improved humanitarian service provision. It was also agreed that the partnership would be open and dynamic, allowing individual partners the right to withdraw at any time without penalty, and enabling new members to be invited, subject to the changing environment of the business. Memorandums of Understanding and letters of intent to work were drawn up between partners and potential third party service providers, and corporate social responsibility policies were obtained from all private sector partners.

Synergy and complementarity

Between them, the MUIIS partners offer a valuable range of skills and experience, which complement each other to provide an effective overall fit. The use of a gender lens has contributed to the project design and performance.

"Bringing partners on board was a deliberate strategy to ensure strong technical input, but also with the long-term vision for scaling and sustainability in mind," said Dr Benjamin Kwasi Addom, Programme Manager of MUIIS at CTA. "There is a need for all partners, including those who see its business potential, to work together to nurture the initiative in order to move from project status to a self-sustaining ICT-enabled agribusiness capable of transforming the sector, and I am confident that we will achieve this."

Although not the exclusive beneficiaries of this wide-ranging initiative, farmers are at the heart of it, and farmer organisations have been engaged from the design stage. They will also play a significant role as the initiative develops, from a funded project to an autonomous business-based undertaking, ultimately taking over ownership of the



scheme, sharing revenues with other consortium partners according to a pre-agreed plan. As a result, more than 150 managers and leaders of the cooperatives and farmer organisations have been sensitised and educated in the principles behind the design of MUIIS, and how this can help empower them as institutions ready for business.

The initiative was an ambitious one, and as such it has encountered a range of obstacles along the way. On the positive side, the experience has produced a number of valuable lessons, which are being taken into account, and the design adjusted, as the initiative moves into its next phase.

LESSONS LEARNED

Choose the right mix of partners

Simple partnership is critical to success. The MUIIS partnership is a complex consortium with seven primary partners and five key secondary partners. It includes the users, satellite data partners, IT partners, capacity-building institutions and research institutes. However, this extensive system has had many negative implications for the delivery of the activities. The MUIIS experience highlights the importance of identifying a limited number of partners with strong synergies, and focusing on specific issues that bring quick gains.

Tap the human resource capital from the ground

It makes good sense to capitalise on the rich array of human resources within communities, where there are generally large numbers of well-skilled and experienced fieldworkers. In this case, a critical feature of the project design was the decision to tap the human resource base of the farmer organisations. The 200 MUIIS Service Agents (MSAs) who have been mobilised and trained are from the communities and they know their farmers. These agents are the foot soldiers and business wing of the project, and their empowerment is leading to a cascade effect on the ground.

Find different solutions for different problems

Whilst partnership and collaboration are critical, focus should be the goal. The challenges of farmers are numerous, and most service providers mistakenly believe that one initiative can address all problems, regardless of their specific nature. MUIIS has decided to focus on and ensure results. Other services can be added in the future, or embedded at a later stage for the benefit of farmers. The primary product is one that offers customised extension and advisory service for increased productivity and resilience against climate variabilities. All others are secondary.

Reach out to the end users

The experience has demonstrated the need to understand the most effective way of reaching end beneficiaries, such as working with national partners instead of regional ones in the case of farmer organisations. MUIIS started with regional partners, moving slowly to the ownership model with the national farmer organisations. While the regional partners may be in a better position to supply advocacy and engagement with the international partners, it is important that national partners are in direct communication with other implementing partners, to ensure better user engagement and fewer administrative processes and delays.

CHAPTER 2

ENGAGING THE STAKEHOLDERS, INCLUDING THE USERS

The MUIIS initiative targets farmers, but these are not the only beneficiaries of this far-reaching initiative. Involving a wide range of other actors has been crucial since the design stage, and some of them are already reaping the rewards.

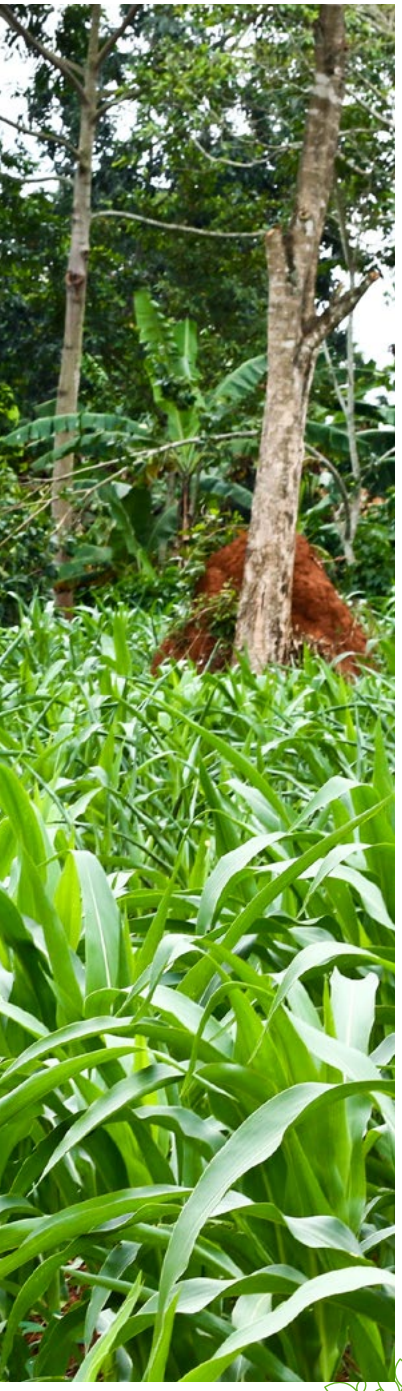
The initiative set out to reach 350,000 farmers in Uganda within three years with a bundle of timely, accurate and actionable weather, agronomic and index-based drought insurance services, drawn from satellite data. The dynamic was based on recruiting agents from within the communities, targeting cooperative leaders and equipping agents with content and technology to support farmers who signed up for the services through cooperatives and farmer organisations. That is an ambitious undertaking by any standards. So how did the partners weave the various strands to generate the final product and make it available to farmers? The initiative design was careful to include all potential actors across a wide spectrum, inviting many of them to workshops and engaging with them from the outset. The following is a portrait of the key players in the MUIIS value chain.

The MUIIS Service Agents

MUIIS relies on a strong support system to grow the project into a business. Crucially important in the mix of actors are the MUIIS Service Agents (MSAs), who have been equipped with smartphones and trained in collecting baseline data, profiling farmers, marketing the information products, and interpreting these for farmers. Generally members of cooperatives, farmer unions, or NGO or government extension staff, they are often themselves farmers, and the incentives earned from profiling have enabled them not only to gain experience in agricultural advisory, but to earn extra income and improve their own farm activities. Effectively, the MSAs serve as a human interface to the technology. Part of their role is to train farmer champions – lead farmers – who in turn provide farmer training, leading to a cascading effect. They also provide technical backstopping to the farmers on how to read

“Mercy Corps Uganda’s AgriFin Mobile programme is an implementing partner on the MUIIS initiative that promotes the increased use of ICT and digital services among the rural communities. Through this initiative, over 190 Farmer Based Organisations registered under the MUIIS initiative have been instructed on digital financial and mobile money platforms. The provision of mobile phone-based weather alerts, agronomic tips and drought insurance has promoted rural financing, e-extension and access to rapid agricultural advisory services among small-scale farmers, who are key to Mercy Corps Uganda’s AgriFin Mobile programme.”

Dennis Acobi, Mercy Corps Uganda



and interpret the SMS messages, and actively promote the services to farmer organisations, input suppliers, NGOs and the farmers themselves. Since the initiative launch in October 2015, a network of nearly 200 MSAs has been trained, between them creating a database of 150,000 detailed farmer profiles, which include information on their farming techniques, their history of access to inputs, extension and financial services, and the GPS locations of their fields. These are an invaluable component, both to ensure that suitable tailor-made agricultural advice is delivered to the farmers, and to attract buy-in from other agri-players, such as providers of inputs and financial services, strengthening the prospects for sustainability when the project ends.

The farmers

At the core of the MUIIS initiative are the farmers who are benefitting from the information received via SMS alerts. They are being reached through a range of channels, to raise awareness about the scheme and how it works. These include marketing campaigns, radio programmes, community meetings and field visits by MSAs and initiative partners. A critical component of MUIIS is capacity-building through a training of trainers, or cascaded approach, training farmer leaders and equipping them with the content and technologies to support each other with extension advice. The MSAs who received direct training from the project partners organise community meetings and train the farmers in the MUIIS products. Those farmers who are willing are then profiled into the MUIIS database.

The women farmers

Inclusiveness is a special feature of MUIIS, as recognised by the World Economic Forum, which praised the gender focus used in the design when it highlighted the initiative as part of its New Vision for Development in 2017. In Uganda, as in many developing countries, women make up the majority of people working in agriculture, and the MUIIS initiative has made special efforts to include women, both as MSAs, where they account for 42%, and as farmers who adopt the service.

"We found that reaching out to women farmers is not only a key success factor, but also an important contribution to the sustainability for our initiative," said Carol Kakooza, CTA's Initiative Coordinator based in Uganda. "All women smallholder farmers we speak with are eager to try anything that takes them out of poverty, while only three out of 10 male farmers we speak with join the MUIIS programme."

Leaders of farmer organisations

The choice of working through farmer organisations and cooperatives formed a cornerstone of the MUIIS plan, in an attempt to increase outreach to small-scale Ugandan

We found that reaching out to women farmers is not only a key success factor, but also an important contribution to the sustainability for our initiative.

farmers and persuade them of the returns to be had for investing in ICT4Ag. The initiative is working with the Ugandan National Farmers Federation (UNFFE), which has more than 3 million members, and the Ugandan Cooperative Alliance (UCA), which has more than 1 million members. Their buy-in is key to mobilising their members, and a workshop was organised in 2017 for that purpose. Although engaging with this group was part of the initiative design, failure to connect with farmer organisations and cooperatives to a sufficient degree and from an early stage has proved an important lesson. In an effort to redress the situation, initiative managers are now working closely with these groups to reach their members. District Farmer Associations (DFAs) and Area Cooperative Enterprises (ACEs) involved in MUIIS are receiving a range of benefits, including a monthly airtime and internet data package to support the field work, and access to credit and loans through partner financial institutions. Other benefits to be made available in the coming seasons are access to subsidised fertiliser and seed through partner input companies, and access to recognised aggregators for market linkages after production. MUIIS has also provided cooperatives and farmer organisations with training in the role of ICTs in agriculture. Through the initiative, the capacities of more than 200 existing and newly formed farmer cooperatives and groups are being strengthened, placing them in a position to negotiate and operate more efficiently by participating in global markets with the enabling power of ICTs.

Agro input dealers and aggregators

Workshops have been held across the four regions of Uganda in an effort to engage these important players. The sessions sought to understand their needs, and explain the business value of the MUIIS initiative, and how it can benefit them. Interested agro input dealers and aggregators can be profiled into the MUIIS database, enabling market linkages to be made with farmers, as recommendations go out via SMS on inputs that could help to improve their yields.

Policy-makers

Uganda's Ministry of Agriculture Animal Industry & Fisheries (MAAIF) and National Information Technology Authority Uganda (NITA-U) have been involved in MUIIS from the start. MAAIF is on the steering committee to offer advice, and representatives from MAAIF are invited to all the major events and activities planned by MUIIS. When the initiative was in the planning stage, MUIIS officials met with District Officers of the government extension service on the ground to explain the scheme and enlist support. Farmer data and other remote sensing data being generated through the initiative can contribute to decision-making at national level by these institutions.

The Dutch Embassy

With core funding from the Dutch Ministry of Foreign Affairs, MUIIS works closely with the Dutch Embassy in the capital of Kampala to align activities with other agricultural initiatives under way in Uganda. Joint activities are conducted in the field, and embassy staff regularly attend MUIIS steering committee meetings and advise on the initiative.

Mobile Network Operators

Mobile Network Operators are also key stakeholders. MUIIS is currently working with Airtel and MTN, but the goal is to engage with these operators more effectively, so that they see the value of the service and consider subsidising subscription costs for smallholder farmers.

Insurance companies

Index-based drought insurance is an important component of the MUIIS bundle of services, and the initiative is working closely with the Agricultural Insurance Consortium in Uganda to support the service to farmers.

The global audience

Although MUIIS has been launched in Uganda, its reach has extended way beyond national borders. It has already reached – directly and indirectly – hundreds of thousands of stakeholders through advocacy, marketing and promotion initiatives, both in Uganda and internationally. Through the MUIIS web portal and social media, a global audience has been made aware of the potential of using remote sensing technologies to improve extension and advisory service delivery to smallholder farmers. The MUIIS initiative has also been presented at a number of international conferences, and featured in the media, including on Dutch television, Artificial Intelligence Video, and at the World Economic Forum in 2017.

Key to the strategy of stakeholder engagement has been an attempt to understand the MUIIS customers, and the challenges they face. This has involved carrying out a user needs assessment, and applying a sound monitoring strategy to

support the development and adaptation of the services and associated business model. Acceptance of the MUIIS service has been driven by building trust between the product and the farmers. MUIIS has placed a strong focus on strategic and effective advocacy, training, awareness creation and knowledge exchange about the initiative and the product. Experience capitalisation strategies to document and share success stories and learn from mistakes during the implementation journey have been streamlined, and partners are taking advantage of this to share their experiences through a wide range of channels.

The benefits of MUIIS are not just for the farmers. The MSAs also stand to gain income earning opportunities, receiving a commission for every paid subscriber they sign up, as well as valuable insights for their own farming activities, as Eric Mbidde, an agent from Luwero District, who joined MUIIS after a spell of unemployment, attests:

"I have profiled 700 farmers and I have learned a lot in the process. I have been contracted by three large-scale farmers to provide extension services on technical issues like pest management, soil fertility management, early or timely planting etc. I have also become a better farmer and grow bananas, coffee and maize for sale, as well as poultry and livestock," he said. "In future I would like to buy some pigs and also start biogas production. I am confident that with all the skills I have acquired with the MUIIS initiative, my life and that of my family will continue to improve."

“We at the UCA are proud to be associated with the MUIIS initiative. This is one initiative I personally feel connects to the farmer directly, bearing in mind that information is a powerful tool at all levels of development. When a farmer is able to connect to the digitalised system and receive weather and agronomic tips, market information and above all insurance, this is a great innovation that eases UCA's work in its efforts to revitalise the cooperative movement. ”

Ronah Nyiraneza, initiative coordinator MUIIS,
Uganda Cooperative Alliance

LESSONS LEARNED

Involve stakeholders from the planning stage

Stakeholder involvement is critical. A broad range of stakeholders, including policy-makers, third party service providers, users, as well as potential competitors have been engaged from the outset. Enabling users to become owners of the service appears to be an incentive for buy-in from farmers and farmer organisations.

Make the service attractive to users

The CTA proof of concept for this initiative and some other earlier ones confirms that the notion of delivering satellite-based information to farmers is a sound one. Quality content is guaranteed. The question is how to present the model in the most compelling way to farmers, and encourage them to pay for a product that is intangible – and for which they can see no immediate benefit. MUIIS aims at focusing on improving the value of its product, and making it attractive to other value chain actors who might be willing to subsidise the cost for farmers.

Allocate funds for marketing and product promotion

A percentage of the budget should be allocated to seasonal marketing, sales and product promotion during project design, which is critical for successful uptake by farmers. In the case of MUIIS, this expense was not fully factored into the original proposal and is therefore not covered by the budget. This undoubtedly had an impact on adoption rates of the bundled service. Efforts have since been made to mobilise resources internally, and where possible to attract potential partners to help achieve the ambitious plan that has been developed for promotion and marketing.

Obtain clarity regarding roles of project implementers

The MSAs were mobilised mainly through farmer organisations and other institutions. They have a different role from that of government extension officers, and this sometimes results in conflicting interests in reaching farmers. Isolated reports of intimidation and refusal to be recognised have been made. Since then, special identity cards have been produced for all MSAs, to link them with the project. Progress has also been made with Uganda's Ministry of Agriculture Animal Industry & Fisheries (MAAIF) in ensuring that the MSAs are recognised as project staff while in the field, so as to avoid conflicts with other extension service providers.

CHAPTER 3

BUILDING THE SATELLITE DATA-ENABLED INFORMATION PRODUCT

Developing satellite-based information products suitable for farmers is a complex process requiring solid expertise and powerful synergies. The MUIIS initiative has brought together partners with experience in data, knowledge and information to retrieve the geodata, process it to develop weather and agronomic information and crop insurance, and create end products to generate practical extension messages aimed at users on the ground.

A needs assessment study for MUIIS revealed five major challenges reported by farmers that require timely and accurate sources of information to address them. These are pests and diseases, high climate variability, low soil fertility, limited access to inputs, and lack of information on production enhancement technologies. Other constraints include low prices, lack of market access and information, inadequate transport and poor storage facilities. Only 17% of the respondents reported having access to extension services.

The MUIIS need assessment study revealed the following findings about farmers
55% of farmers are illiterate
95% have never heard of weather or agricultural insurance
80% have not received weather information or do not trust what they receive
Weather and drought have had a big impact on their yields
70% have one meal a day due to poverty
65% own a usable mobile phone
80% have not received any agricultural tips of any kind
75% own and listen to radio
40% are willing to pay for a good service that will ensure good yields

MUIIS offers a one-stop solution for farmers to make evidence-based decisions for enhanced productivity, profitability and resilience. The initiative offers three main products bundled into one package, with the potential for adding new products in the future.

The initial products include:

- Weather information/alerts
- Agronomic tips
- Index-based insurance

The MUIIS information products are broken down into pre-season, in-season and post-harvest alerts, accompanied by recommended action. Other alerts are sent regarding the customer's insurance policy.

- Pre-season alerts: Best practice tips aimed at helping farmers to prepare for the cropping season.
- In-season alerts: Guided by earth observation through satellite images, crop calendars developed, validated by the MUIIS team, and updated weekly with the weather and agronomic data provided by partners.
- Post-harvest alerts: Best practice tips for harvest and storage.
- Insurance alerts: These are related to the index-based drought insurance, and keep farmers informed of payouts that they may expect to receive.

Data, knowledge and information

Each partner brings a unique set of expertise to the delivery of ICT-enabled extension services to farmers who sign up for the MUIIS service. The information chain is made up of three components – data, knowledge and information – each managed by specific partners who are proficient in that domain, but who also work in synchrony with the other consortium partners to ensure complementarity.

The three private sector partners – eLEAF, EARS and aWhere – have responsibility for coordinating the satellite data acquisition from a number of sources, as well as its processing, storage, analysis and modelling. As private sector partners, they have a vested interest in developing it to become a sustainable standalone business, which will continue to generate revenue. These data partners work in close collaboration with the knowledge partners – CTA, AGRA and farmer organisations – to transform the satellite data into actionable information services based on agronomic knowledge and ground data from the users. At the same time, they work with the information partners – Mercy Corps and the farmer organisations – to ensure that acceptable end products are communicated to farmers.

In practical terms, farmer profiles that are generated by the farmer organisations through the MSAs are made available to the satellite data partners. The profiles are compiled on the basis of a number of indicators, which will help to shape a customised service for each farmer. The satellite data partners use these profiles as a starting point to begin generating a large set of data around the geographic boundaries of the profiles. Agronomic data enabled by satellite images is provided by eLEAF, and data for the insurance product enabled by satellite data is provided by EARS. This data is complemented by ground agronomic data, such as crop calendars and soil situations provided by AGRA and NARO.

The data from all these different sources is now combined with aWhere's weather data, before being taken through a series of processing steps. At this point, the disaggregated data is made available to the team of agronomists, under the leadership of AGRA, working together with NARO. This expert team then validates the final content, using its insights into the specific commodities targeted and the situation on the ground in Uganda. Next, messages are crafted with support from extension specialists, based on the profiles of farmers, their crop and geographic location, and on the format prescribed by Ensibuuko. The MUIIS intelligence system enables automatic matching of the messages with the farmer profiles. As the final stage of the process, subscribing farmers receive alerts by mobile phone in the language in which they have opted to receive them, backed up by training support from MSAs on how to act on this information.

Advice for all seasons

To receive the bundled MUIIS services, farmers pay a service fee of 14,000 UGX (€3-4) per season per acre per crop, to cover the cost of SMS alerts and insure their plot. Additional coverage is available for 10,000 UGX (€2.25) per acre, up to a maximum of 5 acres. In return, the farmer receives weekly weather alerts on precipitation and temperature changes, and indications of the right time for planting, harvesting and other farm activities. Also included is advice via SMS on crop management practices during all stages of production, including fertiliser application, pest and disease alerts and recommended control, and market

MUIIS offers a one-stop solution for farmers to make evidence-based decisions for enhanced productivity, profitability and resilience.

information and connection to the best price buyers for bulk products. In the event of drought, a farmer receives insurance compensation of up to 290,000 UGX (€65) per acre, per season.

The insurance component of the MUIIS bundle consists of a single-peril (drought) index insurance product developed by EARS on the basis of the EARS Relative Evapotranspiration (RE) index. The insurance policy based on this index is made available to Ugandan farmers by insurance companies who are members of the newly formed Agricultural Insurance Consortium (AIC). The weather, agronomic and evapotranspiration data that underlies the drought insurance indices is acquired through geostationary MeteoSat satellites. Up to 110 images per day of profiled farmers' fields who have signed up for the service are acquired to create the information products.

The MUIIS product development process has been deliberately designed to be agile, given that requirements for such a service had not been fully understood prior to the launch of the initiative. Experience shows that the users – in this case farmers – will only know what they want after they have experienced an initial version of the product through a pilot phase. Furthermore, as an electronic product, requirements often change during the development process, which in this case spanned almost a year, and new and emerging technologies make implementation strategies unpredictable. The Minimum Viable Product (MVP) that was tested in the first season has been completely transformed, based on feedback from users and changes in the technological system, as well as in the environment. The current full product being rolled out will be adjusted and updated, taking into account farmer requirements expressed in a user survey, before the first season of 2019.


RALNUC
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BUNDLE
To subscribe dial

LESSONS LEARNED

Be flexible and ready to adapt to changing technical issues from the field

The GPS functionality of the smartphones acquired for the project had problems in capturing the points on the field when the phone was offline, especially in very remote areas. The issue was not easily identified until late 2017. Technology partners are now optimising ways to improve the GPS capture time. Also, most MSAs are now acquiring their own smartphones, since they have made revenue from the commissions received during the past two years, and are now viewing MUIIS as a business.

Ensure thorough and regular testing of delivery to users

Message delivery has been streamlined and the thresholds developed by the agronomists have been tested against weather data from aWhere. Additional satellite data is being introduced to complement and improve the current messages.

Plan for logistical issues due to distances

It is important to take account of the integration challenges faced when dealing with logistical issues posed by system data providers and service administrators that are located across multiple continents and time zones.

> “I was working as an Agricultural Extension Officer with the District Farmer Organisation in Tororo when I was recruited onto the MUIIS initiative some time last year. I took up this job to complement my income so I can fulfil my dreams. I have used the money earned from MUIIS to pay school fees for my siblings, and buy agro-inputs for my two acres of land where I grow maize and beans. I am also proud to say that I have started constructing my residential house in Iganga!”
>
> Derrick Naweya, 27,
> MSA Tororo District

CHAPTER 4

DEVELOPING AN ICT INFRASTRUCTURE FOR FARMERS AND THEIR ORGANISATIONS

Public, private and development partners have joined forces to offer low-cost bundled information products via electronic platforms for maize, soybean, beans and sesame farmers. The MUIIS products are modelled from geodata feeds into user-friendly weather and crop specific agronomic messages delivered to farmers by mobile phone.

The development of the MUIIS suite of tools has involved a team of technology, communication, data, agronomy and extension experts, working together to create a package of services enabled by ICTs, with all the information coming into the system and going out to farmers channelled through ICTs, from computers to mobile phones. The bundled information services – agronomic tips, weather data and insurance against drought – are delivered to farmers who subscribe to the paid service, mainly by SMS on mobile phones, though other channels such as Interactive Voice Response (IVR) and call centres may be added as the services develop.

The MUIIS dashboard

Given the important role carved out for farmers and farmer organisations in the MUIIS initiative from the very beginning, it was crucial to develop a platform that was well suited to these key users. For this reason, care has been taken to design a user-friendly dashboard that farmer organisations can easily log into and interact with. The MUIIS dashboard is the central control system, which enables users to manage SMS content, as well as farmers' data and subscriptions and administrators to view summary statistics on the service's users and outputs. The dashboard homepage tracks weekly, monthly, seasonal and yearly totals of farmer profiles and subscriptions, as well as a summary of revenue received and messages sent. Making all this data easily accessible and useable will become even more critical as the initiative progresses, so that the farmer organisations have full understanding and control of the system before they eventually take over control, using it to offer services to their farmers and generate revenue through these and other sources.

In addition, a strong decentralised feature has been built into the platform design, to make it more readily accessible and relevant to users on the ground, and specifically to users from DFAs and ACEs – the district level wings of the principal national farmer organisations involved: UNFFE and UCA. This will ensure that DFAs and ACEs can use the farmer profiles at local level to do business deals with input, financial and other service providers, to the advantage of themselves and their members.

The delivery channel

After being profiled, farmers wanting to sign up for the MUIIS bundle are asked to dial a short code from their mobile phones, which then takes them through a simple step-by-step process. This user-friendly system is linked to each farmer's profile, helping to ensure that the messages sent out will be tailored to suit his or her needs, and delivered in the appropriate language. The subscription is paid through a mobile money service, as is the payout for any farmers who qualify for compensation under the index-based weather insurance component of the bundle. In both cases, this ensures that farmers do not have to waste valuable time leaving their fields to travel to the nearest bank. It also reduces the risk of carrying cash, and ensures that payments are made and received on time. MSAs are on hand to assist any farmers who have trouble in setting up these initial message retrieval and payment systems.

The receiving end

Farmers who subscribe to the service are sent personalised automated message alerts, containing customised advice based on the specific conditions in their field and other factors, calculated using high-resolution satellite weather and agronomic data provided by partners.

The messages are broken down into pre-season, in-season, and post-harvest alerts, including several messages about the customer's insurance policy. For cases where there is more than one unfavourable condition for a farmer's crop, e.g. when rainfall is too low and temperature too high, the MUIIS system is designed with a decision matrix to automatically select the more damaging of the two conditions. For example, for corn in the vegetative stage, low rainfall might be determined as the most damaging condition. Therefore the alert for unfavourable rainfall would be prioritised over an alert for unfavourable temperature.

In practical terms, the messages may relate to the probability of pests occurring, the best planting season, or soil composition forecasts – which may give early warning of drought – and are generally accompanied by a recommended course of action. Messages are translated into ten local languages, including Acholi, Ateso, Japadola, Kupsabiny, Lango, Luganda, Lugbara, Luomasaba, Madi and Runyankole. Subscribed farmers receive the SMS alerts in their preferred local languages.

The following are examples of messages sent to farmers:

MUIIS Tip_Spray preferably in the afternoon but avoid very cloudy afternoons as the rain will likely wash away or dilute the pesticide

MUIIS_Normal conditions – observe for nutrient deficiencies, pests and disease occurrences_ apply fertiliser and or spray as deemed necessary

MUIIS_There is an outbreak of fall army worms_ these are greyish-brown caterpillars which nestle themselves in the maize stems and destroy the crops

MUIIS Knowledge App

From the season starting in July 2018 onwards, MSAs will be able to use the MUIIS Knowledge App as a supplementary tool to help and advise farmers who have subscribed to the service. The SMS alerts have a limit of 160 characters, which restricts the detail of any information that can be relayed to recipients. With the development of the MUIIS Knowledge App, farmers will be able to contact their local MSA and ask for additional information, which will automatically have been uploaded onto the agent's smartphone.

As part of the initiative, the farmer organisations UCA and UNFFE are being empowered to improve their management structures, processes and procedures by using ICT services. As a result, they are expected to have stronger partnership capabilities to engage with the public and private sectors, NGOs, international organisations and their communities. MUIIS has also offered support by developing the ICT infrastructure of farmer organisations, promoting gender sensitive services linked to ICTs in agriculture and producing digital and print materials to help organisations reach their members more effectively.

Making all this data easily accessible and useable will become even more critical as the initiative progresses.

LESSONS LEARNED

Keep ICTs relatively simple for end users

Experience from the MUIIS project indicates that an ambitious proposal with a high ICT agenda may not necessarily be feasible on the ground. Most of the time, a simple communication tool to complement the traditional tools used by farmers can be sufficient to bring about significant change. There is a need to understand the challenges facing the users and agree on what kinds of applications they can use before implementing any ICT4Ag services. The MUIIS platform is a simple SMS-based tool which is based on Unstructured Supplementary Service Data (USSD) technology to allow farmers to subscribe and receive messages using feature phones.

Deliver on time to local staff as promised

Local project partners are not new to development projects. Such projects come and go and partners are used to the operating procedures. In the case of MUIIS, several promises were made to local partners at the beginning, and these took time to fulfil. Although most of the delays were rectified at a later stage, these affected the take-up and morale of most local partners, especially the MSAs and their institutions. A revived network of MSAs is now being built, who will view MUIIS as an initiative that transcends a conventional development project, and are willing to become MUIIS business units for sustainability.

Provide timely and solid technical support

Technically, most of the MSAs have basic knowledge of smartphones, but need substantial technical support in order use them professionally. Secondly, fieldwork is completely different from office work. The MSAs do not work from 9 am to 5 pm only on weekdays, but have to make themselves available around the clock, 7 days a week. This calls for a dedicated team that is online on a 24-hour basis to respond to urgent issues. Recognising this need, Mercy Corps and Ensibuuko have developed a dedicated team that responds to technical issues from the field, day and night. There is also peer support from more experienced MSAs to the less experienced ones, communicating through WhatsApp groups.

Ensure data is adequate for agri-advisory messages

For the agritips models, the evapotranspiration rate data for some crops in Uganda is not available, which has had an impact on the quality of advice transmitted. More research is being carried out by AGRA and NARO to address this issue in order to improve future messages.

Thorough research needed before deciding on ICT4Ag tools

The design and conceptualisation of ICT4Ag initiatives should begin with detailed consultations with the intended users, including needs identification and a goal to hand over ownership to users. MUIIS engaged farmers and farmer organisations from the start, and aimed to position them so they were ready to own the service after donor support ended. The suite of ICT solutions being deployed is therefore simple and targeted. Subject to demand, more features will be added to make the bundle accessible and useful.

Ensure regular training at farmer level

Though simple, ICTs are foreign to smallholder farmers. They need basic training and regular seasonal follow-up on how to subscribe. Many individual subscriptions during the test season encountered problems due to farmers not completing the mobile money payment process. On investigation, this was mainly the result of insufficient funds on their mobile money accounts. Going forward, MUIIS is encouraging group subscriptions through farmers' institutions and cooperatives to reduce this technical issue.

"I am a single mother of one child and joined this initiative last year in September. I had so many debts that I cleared as soon as I was paid after registering 230 farmers. I was so excited and motivated to work hard and earn enough to look after my child and grandmother who is diabetic. She is now much better since I can afford her medication. I have also gone ahead and trained and mentored senior six leavers in my community to learn how to profile and give agricultural advisory to farmers in Budaka. They are now earning some money and will be able to afford their university or tertiary education. I have also started building my house and I now see a bright future for my daughter and me."

Annet Mugala, 26,
MSA Budaka, Eastern Region

CHAPTER 5

VALUING FEEDBACK FOR QUALITY CONTENT

An intricate system of monitoring and cross-checking has been set in place to ensure the quality of the content being issued to farmers, as well as the system designed to retrieve and process the data, before sharing it with users.

Feedback is critical for an innovative initiative such as MUIIS, given its ground-breaking nature and the breadth and range of its activities and partners. Partners are constantly striving to improve its advisories, seeking input and feedback to ensure that content addresses farmers' most pressing needs, that delivery is achieved in the most effective manner possible, and that the end product meets user requirements to the greatest possible extent. The result is a system that is constantly being fine-tuned, in an effort to ensure that it will become a viable business undertaking, long after the project phase has ended.

A combination of surveys and interviews conducted through the agents and the initiative's online database is being used to collect feedback on the information services. Quality control for the MUIIS Service Bundle has been carefully planned from the start, and covers some of the following areas:

Monitoring and evaluation (M&E) is conducted on the ground through the farmer organisations under the leadership of UCA and UNFFE. This includes tracking the performance of the MSAs, and validating the farmer profiles being submitted. UCA and UNFFE work closely with Mercy Corps and Ensibuuko to verify and approve the data used as a basis for farmer advisories. MSAs are kept up to date on the changes in the data collection instrument, and continuous training is organised on the use of the tools and systems for all actors concerned.

Rigorous quality control

For weather data quality, aWhere works with AGRA and NARO to ensure that the MUIIS data complements the national weather data, so as to provide extra value to MUIIS farmers. The agronomic data driven by eLEAF is complemented by ground data from AGRA and NARO and by weather data from aWhere, to provide actionable information to farmers based on the weather situation of their fields. For the purposes of quality assurance, the agronomic data from eLEAF is overlaid with both farmer profiles and crop calendars produced by AGRA and NARO.

For the insurance component of the MUIIS Service Bundle, which is led by EARS in collaboration with AIC, EARS works closely with aWhere, eLEAF and AGRA to reconcile the sources of data for the information service with their own data, in an effort to ensure consolidated results in the field.

The ICT infrastructure – the data collection tools, communication channel and the dashboard – are led by Mercy Corps and Ensibuuko. Data from farmer profiles, subscriptions and other features are closely monitored and verified before feeding them into the system. Messages going out to farmers also undergo a rigid series of verification and approval process, to ensure that farmers receive relevant messages.

The MUIIS Dashboard is an intelligent system that supports monitoring and feedback on the product, as well as farmers' responses. While the system does not currently receive feedback directly from farmers, MUIIS uses various channels such as WhatsApp groups, phone calls and community meetings to gather feedback from farmers. Extensive testing of the technological platform has been carried out with the help of 50 MSAs, who have been engaged to monitor the efficacy of the menus, the system's ability to receive mobile money payment, the sending of SMS messages, and the platform's ability to track payments and share payment history with partners. Feedback on the system has been shared by the MSAs through a range of channels, and the information subsequently acted upon and improvements made to the system prior to the deployment of the next batch of messages.

Adoption and payouts

The MUIIS Knowledge App, developed in time for the start of the season in July 2018, will be used by the MSAs to support the entire quality assurance process. Located in the communities near the farmers, MSAs will use the app to support their work in verifying situations on the ground, as well as to communicate to data partners the need to refine their content for farmers. Monitoring via the Knowledge App will also help in the task of verifying results of the index-based insurance.

Feedback shows that as of August 2017, after one season, 100 farmers had subscribed to the service. By March 2018, that figure had risen to 497, but still fell short of the target. The relatively low take-up has been variously attributed to technical issues during the subscription, delays with the product rollout, the cost involved, and poor understanding by farmers of the value and benefits. Monitoring of the insurance feature of the initiative showed that 54 out of the initial 100 subscribed farmers qualified for insurance payouts. The average payout per farmer was 16,800 UGX (€3.75), with one farmer receiving 125,000 UGX (€28). A total of 910,554 UGX (€205) has been paid out so far to the qualified farmers.

One farmer who signed up for the service described how it had helped to ward off an impending pest attack on his crops. "I have been receiving weather updates and advisory on when to plant. In addition I got an alert on the Armyworm pest and we were advised on what pesticides to use," said Nalubega Robinah, from Nalweweta Village in Luwero District. "I have so far harvested about 10 bags and yet still have more maize on the farm."

The Fall Armyworm has devastated crops in Uganda, and governments across Africa have struggled to respond to the pest, which, like many of its kind, can be tackled if farmers have sufficient advance warning and are equipped with the right information and resources for action.

Various assessments have been conducted to obtain feedback from end users, based on farmers' experiences with subscriptions and the SMS messages they have received. A third party service has been engaged to assess the relevance of the messages sent, to enable content to be adjusted for the upcoming seasons. Assessments are also conducted on the impacts of advice at various stages throughout the production cycle, as well as on the mobile money payments, including the ease of payment for services supplied, and for payments made as part of the weather insurance component.

"I thank MUIIS for the weather updates that have enabled me to know when to plant. It was a problem predicting what crop would survive, given the uncertainty of weather conditions. Last season, I successfully harvested maize from my farm due to the weather updates and advisory tips I received on my phone. I would like to request MUIIS to provide us with market information so that we are able to know where we can sell our produce."

Bbuule William
Maize farmer, Kyetume Village, Luwero District

Impacts of user engagement

- Two years after the initiative launch, 150,000 farmers have been profiled and 479 have taken out a subscription.
- 233,429 farmers have been reached directly, 50% of them women and 35% under 35 years-old.
- 2,613,636 farmers have been reached with MUIIS information via TV and radio.
- At least 50% of the initial 100 farmers covered by insurance had a payout at the end of the first season due to drought.
- While these farmers paid 14,000 (€3-4) UGX for the service, about 20 out of the 100 had payouts between 12,000 UGX (€2.7) and 125,000 UGX (€28).

LESSONS LEARNED

Set in place effective monitoring and evaluation

Significant numbers of the first round MSAs dropped out of the scheme, due either to lack of interest in the project, or the high turnover at ACE/DFA level and lack of structures, especially within the AGRA and Mercy Corps supported farmer-based organisations. The monitoring and evaluation visits later carried out by the farmer organisations have proved crucial in rescuing the situation and devising a new strategy. Whilst the managers and leaders of the farmer organisations were initially left out of the process, albeit not by design, the M&E visits identified the issue and partners have acted accordingly.

Timely reporting is key to keep the investors comfortable

One of the MUIIS strategies has been to document and report on progress regularly to keep the investors updated. As part of the M&E framework developed within the inception phase of the project, partners have been consistent in capturing data on activities from the field, and in analysing and reporting.

CHAPTER 6

PREPARING FOR A SUSTAINABLE FARMER-LED INFORMATION SERVICE

From the outset, the MUIIS initiative design has looked ahead to the time when the funding phase ends, in an attempt to ensure that the initiative will continue to operate as a self-sustaining enterprise. Adjustment is currently under way to adapt the business model, generating additional revenue streams from the farmer profiles and the satellite data-enabled service.

A common challenge in the implementation of ICTs in agricultural projects is failure to sustain the project beyond donor support. This may be due to a number of reasons, including poor assessment of demands prior to implementation, inaccurate cost estimates, poorly designed business models, the technologies themselves, the complexity of the project with respect to the users, illiteracy, and lack of buy-in from stakeholders.

Bearing all these potential hazards in mind, MUIIS planners took pains from the earliest design stage to place a strong focus on ensuring that the initiative had all the prerequisites for the ICT4Ag information service to be sustainable, continuing well after the initiative itself had ended its funding phase. These included building a strong foundation for a product that can attract business partners through its high standard farmer profiles. Also critical was the setting up of a robust agent network to drive the business on the ground, a viable business model, a plan to transfer ownership to farmer organisations, organising advocacy and rural community awareness to enhance uptake, ensuring authentic and verified satellite data, and last but certainly not least, obtaining support and commitment from all partners involved in the initiative, including the provision of incentives to continue when the three-year initiative comes to a close.

The nature of the main product and service being offered has been made clear from the start, and strategies for demonstrating their value to users are in place and being rolled out systematically. Even though MUIIS has yet to engage a strong, local business partner to take up the business when the initiative ends, the close involvement of the users – farmers and their organisations – is expected to drive service adoption in the future.

“I am a wife and mother of six children and must commend MUIIS for changing my life. In the beginning it was quite challenging to get farmers on board. Some did not trust us but when I engaged the local council, church and other opinion leaders my work became easier. I have used my allowances to build a nursery for orange seedlings which I supply to National Agricultural Advisory Services (NAADS) at 3,500 Uganda shillings (€0.80) per seedling. When I am paid, I hope to buy a small car, finish my house and open a produce shop for maize, beans, rice and groundnuts. I already have the market so it should go well.”

Mariam Kawendeke, 51,
MSA Iganga District

Alternative revenue streams

The decision to include a number of private companies as partners was a deliberate one, based on the creativity and out-of-the-box thinking that characterise this sector, especially in the provision of value added ICTs and in innovative problem solving. Also deliberate was the selection of a good mix of value chains – low-value maize and high-value soybean and sesame – to ensure that potential users of the information service were able to pay for the service.

By the end of 2017, after two seasons of testing, it became apparent that farmers were largely unwilling to pay for a subscription, with a total of 497 opting to take up the bundled service – a figure that falls short of the original target. Those numbers are expected to increase, as farmers become aware of the benefits and news spreads by word of mouth and more structured marketing tools. The fact that more than half the 100 farmers involved in the first season's testing received payouts under the index-based weather insurance component served as a pointer to the concrete advantages that subscription can bring. Even so, as the initiative progressed, it became increasingly clear that alternative revenue streams would need to be explored.

From experience, MUIIS partners have learned that there is no preferred business model when it comes to ICT4Ag value added service provision. It is better to focus on expertise, while at the same time being willing to offer a portfolio of services that support the take-up of the main product. Hence, while efforts have been made to drive the satellite-based information service, several other added services are currently being explored and integrated into the main MUIIS product.

Moving forward, the best strategy would seem to lie in demonstrating the commercial potential of the farmer profiles and the satellite data-enabled information service to other businesses, so that these will agree to pay all or part of the subscriptions for farmers. This will eventually lead to repackaging the current product into two main offers for different clients – the current bundled product with weather alerts, agronomic tips and index-based insurance, and a second product with the information service, but without insurance. This is because businesses and initiatives willing to pay for the service may not be in a position to buy insurance for their farmers.

"We used the first two years to build our unique value, the farmer profiles, the satellite data-enabled product, and the network of agents and institutions," said MUIIS Programme Manager Dr Addom. "So while the figure of 497 subscriptions falls short of the target, there is good potential for that figure to rise substantially, especially once the business model is adapted to reduce the

Building a strong foundation for a product that can attract business partners through its high standard farmer profiles.

financial burden of the subscription on individual farmers. For most ICT4Ag start-ups, this kind of figure is normal. It usually takes 5-6 years to have 1,000 stable subscriptions."

Fine-tuning the business model

A team of business experts has been engaged to update the business plan, so as to ensure the commercial sustainability of the service. Investment opportunities are being explored with input dealers, financial institutions and output aggregators who have seen the potential of the big data being generated. Business discussions are currently under way with a number of potential partners, including Dutch financial service institution the Rabobank Foundation for a pilot credit scheme for farmers in 2018.

This move is expected to open up access to financial services for about 5,000 farmers during the first season of 2018. If the scheme proves successful it could pave the way for the system to be rolled out on a larger scale, a development that would be of significant benefit to financial service providers, farmers and perhaps other value chain actors. Meanwhile, other institutions such as fertiliser companies and NGOs are also approaching MUIIS to access its farmer database in order to provide services to the farmers profiled there. Various other revenue streams are being explored, including developing partnerships to help extend the product reach to some other target groups, and B2B arrangements with companies.

The original plan is and always has been for the satellite-based information service to be owned by the farmer organisations after the funding phase ends, though this may not happen immediately after the officially planned close of the initiative, in February 2019. Farmer organisations, involved from the design stage, have been given specific training, to enable them to ensure efficient service provision when the donor funding ceases. Ownership by the farmer organisations will be based on revenue sharing agreements with other partners, including private sector companies that have every interest in seeing that the initiative continues as a self-sustaining commercial enterprise. So while the precise nature of the post-initiative business model remains for the time being unclear, all the signs point to a long-term future for the MUIIS initiative, and increased incomes for all the stakeholders involved.

LESSONS LEARNED

Conduct business sustainability studies

It is important to involve business minds that can turn the ideas into profit. While the design and implementation of MUIIS is based on sustainability, the strategy to turn the initiative into business has met with several challenges. Future initiatives of this kind should undertake business sustainability studies of the users and the broader national/regional environment, so as to understand the culture of willingness to pay by stakeholders.

Organise subscription collection through effective channels

The project design involved engaging groups such as farmer organisations and cooperatives as units of service, rather than individual farmers. Subscription was expected to be channeled through these groups. However, it soon emerged that the structure of many of these groups was not sufficiently business oriented to enable them to take on this role in an efficient manner. As a result, the system has partially shifted to the collection of individual subscriptions, which currently accounts for about 90% of the total. Savings and credit cooperatives (SACCOs) are now being explored as a new channel for this purpose.

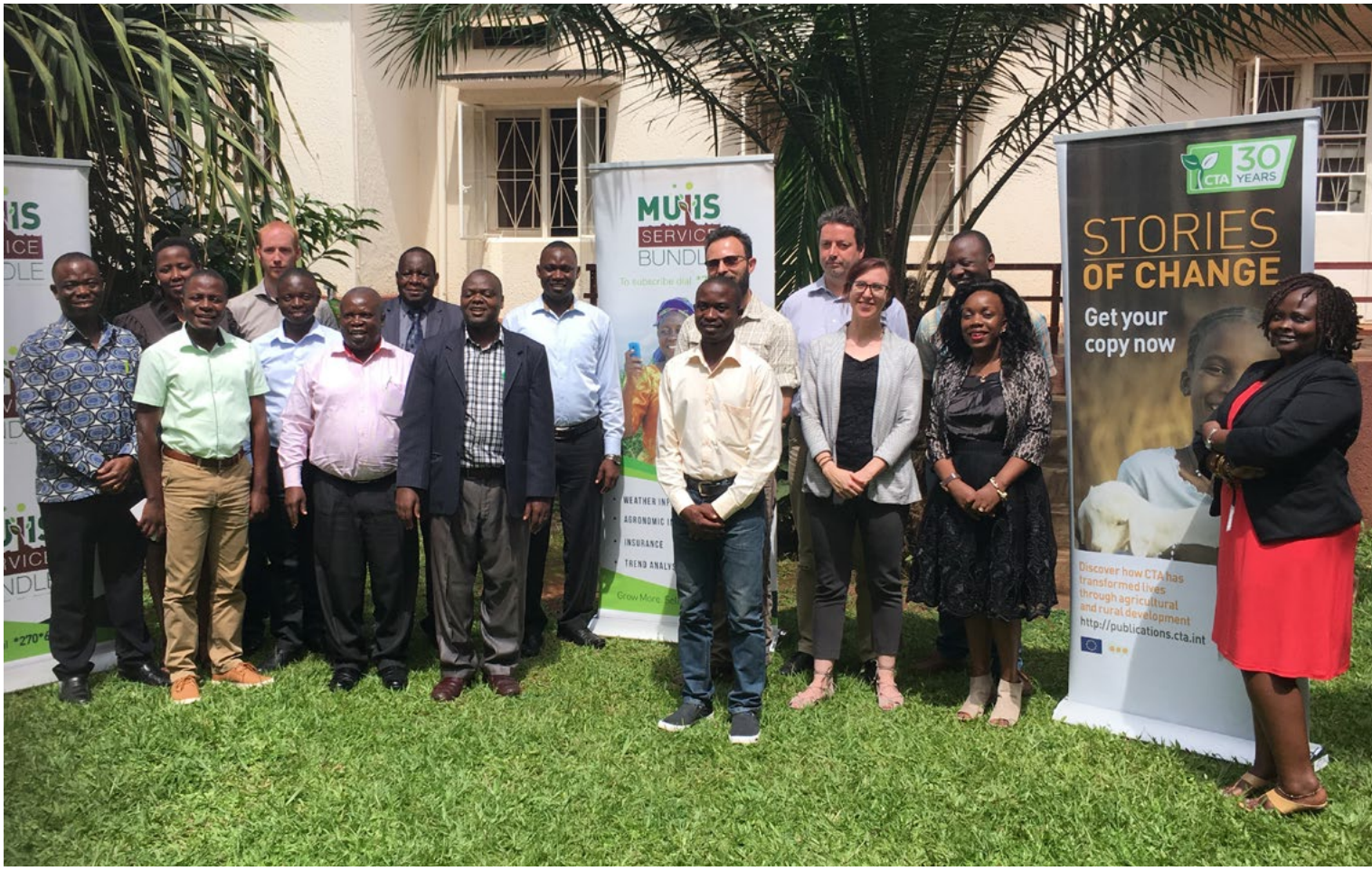
Investigate alternative revenue streams

Although the number of farmers who have taken out subscriptions is gradually increasing, it remains way below the number of farmers who are currently profiled. The main challenge now is to encourage more farmers to use the service, since most are unwilling to pay for it. Other studies and experiences across Africa show that farmers may not be the right group to pay for these kinds of information service. The way forward is to solidify the value of the MUIIS products and services, explore and identify business partners who see value in products and services, such as farmer profiles, agent networks and other assets, and build on these so that they pay some or all the subscription on behalf of farmers.

Identify future business ownership and integrate them from the start

Originally designed as a 'farmer-owned' information service, MUIIS engaged farmer organisations from the start, with the goal of building their capacity to take over ownership of the business in the future. However, due to the challenges of developing a viable business model in combination with

its products, it now appears unlikely that farmer organisations will be in a position to take up MUIIS and drive the business. The future potential is huge, but the projected cost of transitioning it into business is high. An ideal profile of an entity that can take MUIIS forward from 2019 has been defined. This should have been identified earlier in the second year, but being an ambitious initiative, partners were still hopeful that the farmer organisations would take the lead. The profile now being targeted is a social enterprise that does not only focus on profit, but has farmer interests at heart, with local experience working with farmers and ICTs in Uganda. An alternative option to take MUIIS into the business stage is that of a large aggregator with strong links to farmers in terms of input supply and offtake of outputs.



THE WAY FORWARD – JOINING AND SUPPORTING THE INITIATIVE

As it moves into its third year, MUIIS has attracted a wide range of interest – from other donors, and potential development partners, users and service providers. Agricultural extension networks from Central and Western Africa have expressed a wish to stage learning journeys to Uganda to understand the initiative and explore replication options for their countries. The World Bank in Uganda has recommended that the Ministry of Agriculture consider working with MUIIS to reach more farmers. The Gates Foundation has approached MUIIS to explore the model and apply it to public extension systems, and to understand the cost-benefit analysis of the approach, with the aim of applying it to their activities in some other African countries.

Although meticulous strategic planning has been a critical feature of the MUIIS initiative from the start, it has also shown flexibility in adapting to new or unplanned conditions and to learning from lessons along the way. This is already emerging as one of the key strengths of the initiative, and the ability to adapt and embrace new directions and partners as it moves ahead is likely to be decisive in ensuring its longevity.

As part of this deliberately dynamic spirit – itself in keeping with the ICT sector on which MUIIS is based – the initiative is open to using expertise and skills from a wide range of potential new partners to deliver agricultural and financial services to smallholder farmers. These may include new and emerging start-ups, such as innovative value chain anchor firms, and alternative sources of data, so as to meet the changing demands from the undertaking's ultimate beneficiaries as the initiative progresses. It may also include other actors, such as input manufacturers or dealers, banks and microfinance institutions, ICT and insurance companies, research institutes, gender-based organisations, content developers, NGOs and farmer-based organisations, so as to better participate in global markets harnessing the enabling power of ICTs.

If you or your organisation is interested in working with MUIIS in any of these or other areas, and you would like to discuss the possibility of joining us, please contact:

Dr Benjamin Kwasi Addom,
Programme Manager of MUIIS at CTA
Email: addom@cta.int

WHO DOES WHAT?

Current MUIIS partners:

- CTA: project leader, in charge of general coordination, M&E and ICTs oversight
- AGRA: leads the capacity-building and ground agronomic data
- UCA and UNFFE: facilitate the mobilisation of the users/farmers
- aWhere: in charge of satellite data for weather
- EARS: in charge of satellite data for index-based insurance
- eLEAF: in charge of satellite data for agronomy
- Mercy Corps Uganda: leading the technology at the end of the chain

RESOURCES

For more information on MUIIS, please visit: http://muiis.cta.int/ and https://muiis.com

For more information on CTA, please visit: http://ictupdate.cta.int/ and https://www.cta.int/en/

The Technical Centre for Agricultural and Rural Cooperation (CTA) is a joint international institution of the African, Caribbean and Pacific (ACP) Group of States and the European Union (EU). CTA operates under the framework of the Cotonou Agreement and is funded by the EU.

FOR MORE INFORMATION ON CTA, VISIT WWW.CTA.INT

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